PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : G04B 47/00	A1	(11) International Publication Number: WO 00/50963
		(43) International Publication Date: 31 August 2000 (31.08.00)

(21) International Application Number: PCT/IB00/00186

(22) International Filing Date: 18 February 2000 (18.02.00)

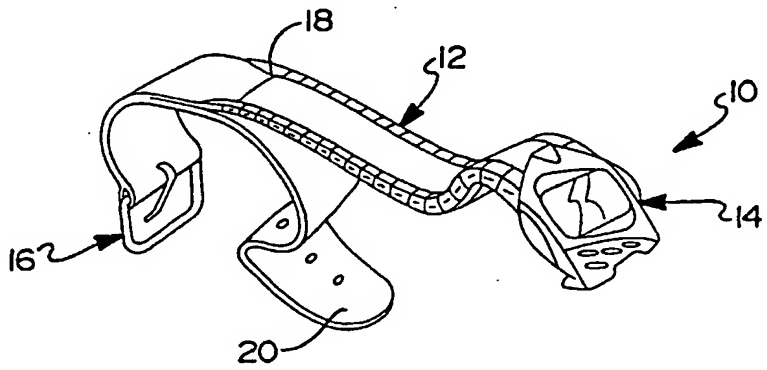
(30) Priority Data:
60/121,106 22 February 1999 (22.02.99) US

(71)(72) Applicant and Inventor: MOSCOVITCH, Jerry [CA/CA]; 59 Cowar Avenue, Toronto, Ontario M6K 2N1 (CA).

(81) Designated States: CN, DE, GB, JP, US.

Published
With international search report.
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: MULTI-FUNCTION WATCH HAVING FLEXIBLE LCD WATCH BAND



(57) Abstract

A multi-function watch (10) having a watch band (12) comprised of a flexible LCD segment. The watch includes a RF receiver (52) for receiving up to the minute financial or other information and displaying such information on the flexible LCD band segment. A watch portion (14) includes a secondary LCD for displaying the current time of day and other items such as day, month and year information. The watch (10) further performs the function of a pager for receiving messages and displaying same on one or the other of the two LCD displays. The watch is extremely lightweight and the flexible LCD band segment can be made longer than necessary such that it can be wrapped around the wearer's wrist several times and easily unbuckled when it is desired to view the full length of the flexible LCD segment.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

MULTI-FUNCTION WATCH HAVING FLEXIBLE LCD WATCH BAND

Technical Field

The present invention relates to watches, and more particularly a multi-function watch having a LCD watch band and a radio frequency receiver included in the watch portion for receiving financial information and displaying the information in a streaming or "ticker tape fashion" on the LCD watch band, and where the wrist watch also functions as a pager for displaying messages on the LCD watch band portion.

Background

Pagers and other electronic items such as laptop computers have become popular recently for displaying financial and stock market information, such as the change in price of stocks that are publicly traded through a stock exchange, on an "up-to-the-minute basis", in addition to messages or telephone numbers. Such a pager incorporates a radio frequency receiver which receives the financial information and/or message and displays it in a "ticker tape" format. However, since the display of the pager, which is commonly a liquid crystal display (LCD), is very small, only an extremely limited amount of information can be viewed at any given time. When viewing streaming financial information such as stock prices, this means that the wearer of the pager must often wait considerable periods of time before the information of interest scrolls across the small LCD display. The small display area also means that any specific financial information of interest, such as the stock price of a particular company, only remains visible on the display for a very short time. Consequently, it is easy for the individual to miss the

pertinent information if it is scrolling across the small display area of a pager with a LCD.

Laptop computers have also gained popularity in recent years as a means for monitoring stock information on a real time basis. Greater Internet availability and access has made it possible for a laptop computer with a built-in modem to access the Internet and retrieve financial information on a real time basis. The obvious drawback in obtaining information with a laptop computer is the need for telephone or cable line hookup, which are usually not available outside of a business office or hotel. The size and weight of a laptop also limit the utility of the laptop as a means for obtaining financial information when the user is away from an office, hotel or other business.

In recent years "flexible" LCD displays have become available. These displays are extremely thin, typically on the order of between about 4-10 mm. Present day technology allows a LCD display to be manufactured in very small dimensions, and even in "strips", which would be suitable in width and length to serve as a bracelet or watchband. Such small, flexible but elongated LCD segments are extremely light in weight, even to the point where one could be worn as a bracelet or used as a watchband. The elongated configuration of such a LCD display would be ideal for displaying continuous financial information in a "ticker" fashion.

It is therefore a principal object of the present invention to provide a wearable device such as (but not limited to) a watchband or a bracelet which incorporates a means for electronically receiving financial information. In this manner the financial information can be displayed by the wearer simply looking at the band portion of the bracelet or watch without even removing the band from his/her wrist.

It would further be desirable to provide a wrist watch which includes an LCD band portion, as described above, a miniature radio frequency receiver adapted to receive the real time financial information or other information such as messages or telephone numbers, just like a conventional pager. A second or main LCD display for displaying the current time of day would also be desirable. In this manner the wrist watch could be used to continuously

display the current time of day while the LCD band portion is used to display financial or other information in a continuously streaming format without affecting the display of time from the watch portion. Alternatively, a suitable switch could be provided to turn off the LCD band display to save battery power when this display is not needed. The overall length of the flexible LCD band could be such that the band is wound around the wrist more than once before being secured by a suitable clasp or buckle. In this manner an extra long LCD display could be provided in the event the wearer is at a desk or other area where the watchband can be laid out flat after being removed. This would further increase the amount of streaming financial information that can be viewed at any given instant.

A wrist watch as described above would provide significant freedom to the user to write, talk on a telephone or perform other tasks while easily monitoring up to the minute financial information in real time. Such an apparatus would be lightweight, unobtrusive, and enable a wearer to easily obtain and view financial information in real time while away from an office, hotel or other business establishment. The apparatus would be especially useful to individuals such as stock traders, investment bankers and counselors, and others involved in the financial industry who need up to the minute financial information.

Summary of the Invention

The present invention relates to a wearable, multi-function apparatus incorporating a flexible LCD display and a means for receiving up to the minute financial information, messages, telephone numbers, or other forms of information. In one preferred embodiment the invention comprises a wrist watch incorporating a flexible LCD display as the watchband portion and a miniature radio frequency receiver for receiving radio frequency signals relating to financial information of personal messages. The watch band may be of a length which permits it to be wrapped around the wrist of a wearer two or three times, so that when it is removed it forms an elongated LCD display capable of displaying a significant amount of financial information in a streaming

"ticker" fashion or displaying messages, telephone numbers, or virtually any other form of information. A second LCD display dedicated to displaying only the current time of day is provided, as is a suitable electronic time keeping circuit. The radio frequency receiver is housed in the watch portion of the wrist watch and optionally includes a menu switch which enables the wearer to turn off the LCD band display to save battery power when only the time keeping function of the wrist watch is needed.

In an alternative preferred embodiment the invention comprises a bracelet having a flexible LCD display and a radio frequency receiver for receiving the financial information in real time and displaying it to the user. The LCD bracelet may be of a length such that it can be would around the wrist several times before being secured with a suitable clasp. The user can then remove the bracelet and lay it flat on a table, desk, etc., and it forms an elongated, narrow LCD display ideal for displaying streaming financial information. Optionally, the bracelet may include a switch to turn off the LCD band display and thereby conserve battery power.

The preferred embodiments of the present invention are lightweight, unobtrusive and easily worn on the wrist of an individual. They enable an individual to easily monitor up to the minute financial information, receive messages and/or telephone numbers, etc. The preferred embodiments of the present invention provide a much greater and more useful display area than conventional pagers having the traditional small, rectangular LCD display, thus permitting a much greater amount of information to be displayed in a streaming fashion at any given time.

Brief Description of the Drawings

The various advantages of the present invention will become apparent to one skilled in the art by reading the following specification and subjoined claims and by referencing the following drawings in which:

Figure 1 is a perspective view of a wrist watch in accordance with a preferred embodiment of the present invention incorporating a flexible LCD watch band;

Figure 2 is an enlarged perspective view of the watch portion and a portion of the flexible LCD band of the wrist watch of Figure 1;

Figure 3 is a perspective view of the watch portion about to be secured to the LCD band;

Figures 4, 5 and 6 are perspective views of the wrist watch of Figure 1 being secured around the wrist of a wearer;

Figure 7 is a perspective view of the watch secured to the wrist of a person; Figure 8 is a simplified electrical schematic diagram of the electrical circuitry of the watch; and

Figure 9 illustrates a bracelet in accordance with an alternative preferred embodiment of the present invention.

Detailed Description of the Preferred Embodiments

Referring to Figure 1, there is shown a multi-function wrist watch 10 in accordance with a preferred embodiment of the present invention. The watch 10 includes a flexible liquid crystal display (LCD) watch band portion 12 and a watch portion 14 secured to one end of the band portion 12. The LCD band portion 12 includes a typical buckle or clasp 16 at the opposite free end that is secured to an end portion 18 of the band 12, and also to a leather or plastic strap 20. It will be appreciated that the strap 20 is not essential to securing the watch 10 around the wrist of a wearer, but will permit the LCD band portion 12 to be laid or held out to form a flat LCD display without having the watch 10 come off of the wearer's wrist.

The flexible LCD display band 12 comprises a thickness of between

about 4 -10mm. The flexible LCD display band 12 is especially well suited for displaying steaming or "ticker tape" financial information. The significantly increased display area enables a much larger amount of information to be displayed thereon at any given time. This makes it much easier for an individual to monitor and note specific information which streams across the band, such as stock prices, personal messages, etc.

It will also be appreciated that the display band 12 could be comprised of a number of interconnected, small LCD segments. The overall band would still be flexible enough to use as a watch band or bracelet. Ribbon cable style connectors could be used to electrically connect the LCD segments.

Referring to Figure 2, the watch portion 14 includes a second, generally square shaped LCD display 22 for displaying the current time of day, date and day information, and a speaker 24 for producing an audio signal (i.e., alarm). A pair of lock release buttons 26 are included for releasing the band portion 12 from the watch portion 14. An optical light in the form of an LED 28 is used for indicating a message has been received.

The watch portion 14 further includes a control panel 30 for controlling the various functions of the watch 10. The control panel 30 may include a wide variety of controls, but in the present preferred embodiment includes a menu button 32, a light button 34 for turning on a backlight associated with both LCD band 12 and LCD display 22, and a scroll rocker switch 36. The scroll switch 36 enables the wearer to scroll backwards or forwards through a message received by the watch 10 which is being displayed on the LCD band 12. A "lock Information" button 38 allows the wearer to lock or "freeze" a message or information scrolling across the LCD band 12.

With reference to Figure 3, the LCD band 12 includes a row of evenly spaced openings 40 along each side edge 42 thereof. The side edges 42 form a frame portion for a flexible LCD portion 44 which is held between the side edges 42 such as by a suitable adhesive. The watch portion 14 includes a pair of opposing lock teeth 46 which are spaced apart such that they are able to engage with any aligned pair of openings 40 to hold the watch portion 14 locked onto the LCD band 12. The lock teeth 46 may be retracted by the

wearer pressing the lock release buttons 26, whereupon a suitable spring loaded mechanism is engaged and the lock teeth 46 retracted against the biasing force of the mechanism.

Referring to Figures 4-6, the watch 10 is affixed by the wearer first securing the leather or plastic band portion 20 around the wrist. The LCD band 12 is then wrapped around the wrist one or more times depending upon its overall length. The watch portion 14 is then pressed down onto the band 12 where the lock teeth 46 are displaced (i.e., retracted) momentarily as they engage with an aligned pair of openings 40. The watch portion 14 is then securely held to the LCD band 12. To view information being displayed on the flexible LCD 44 of the band 12 the wearer can orientate his/her wrist as illustrated in Figure 7 to see a significant portion of the information. If a greater display area is desired, the watch portion 14 can be unlocked from the band 12 and the LCD band 12 laid out flat to expose the entire display area of the flexible LCD 44.

Referring briefly to Figure 8, a simplified schematic diagram of the internal electronic circuity of the watch 10 is shown. A suitable processor 50 receives signals from radio frequency (RF) receiver 52 and from the input switches 32-38. A suitable battery 54 provides electrical power to the various circuits and components of the watch 10. The processor 50 preferably incorporates an internal clock circuit used for keeping the time of day. Electrical signals are transmitted from the processor 50 to the LCD 22 for displaying the current time of day. The processor 50 generates an output signal to the speaker 24 or to a vibration generating circuit 58 if and when a page is received by the watch 10 to let the wearer know that a page has been received. The wearer can then use the menu button 32 to display the message on the LCD 22 or alternatively on the LCD band 34.

Referring now to Figure 9, a bracelet 100 in accordance with an alternative preferred embodiment is illustrated. The bracelet 100 is substantially identical to the watch 10 except that it does not includes any time keeping circuitry or the LCD display 22. The bracelet 100 has a flexible LCD band portion 102, a control portion 104 for controlling the display of information

on the flexible LCD band portion 102 and a suitable locking portion 106 similar or identical to the locking teeth 46 (Figure 3).

The watch 10 of the present invention thus forms a lightweight and convenient means to receive a wide variety of information available by RF broadcast. The invention is particularly well suited to receiving up to the minute financial information such as stock price information and displaying such information on a flexible LCD band. The elongated LCD band provides a significantly increased viewing area over that presently provided by a conventional LCD pager and makes it much easier to monitor scrolling financial information. Those skilled in the art can now appreciate from the foregoing description that the broad teachings of the present invention can be implemented in a variety of ways. Therefore, while this invention has been described in connection with particular examples thereof, the true scope of the invention should not be so limited since other modifications will become apparent to the skilled practitioner upon a study of the drawings, specifications and following claims.

IN THE CLAIMS

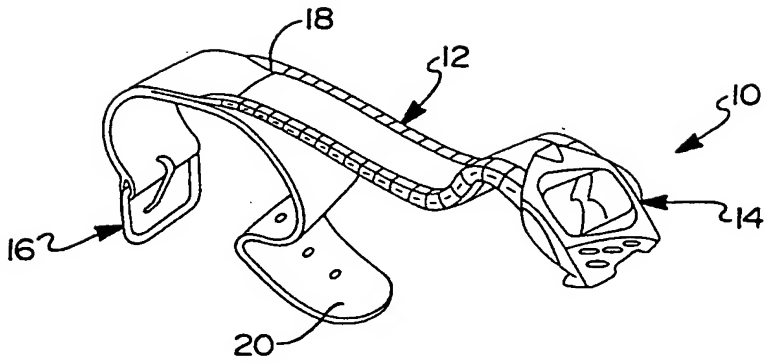
1. A multi-function watch comprising:

a flexible liquid crystal display (LCD) band;

a watch portion including a secondary LCD panel for displaying current time of day; and

a miniature radio frequency (RF) receiver disposed in said watch portion for receiving information via RF signals, whereby information is displayed on said flexible LCD band.

FIG 1



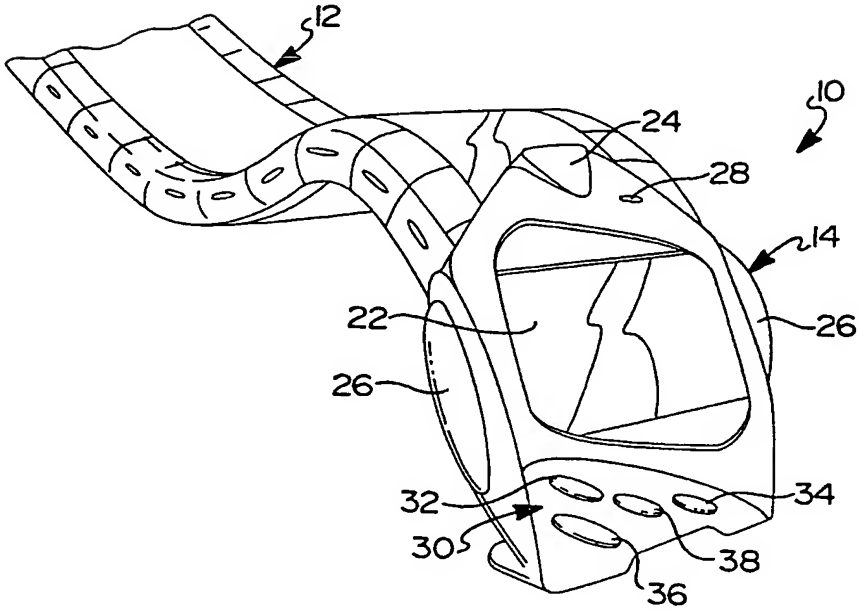


FIG 2

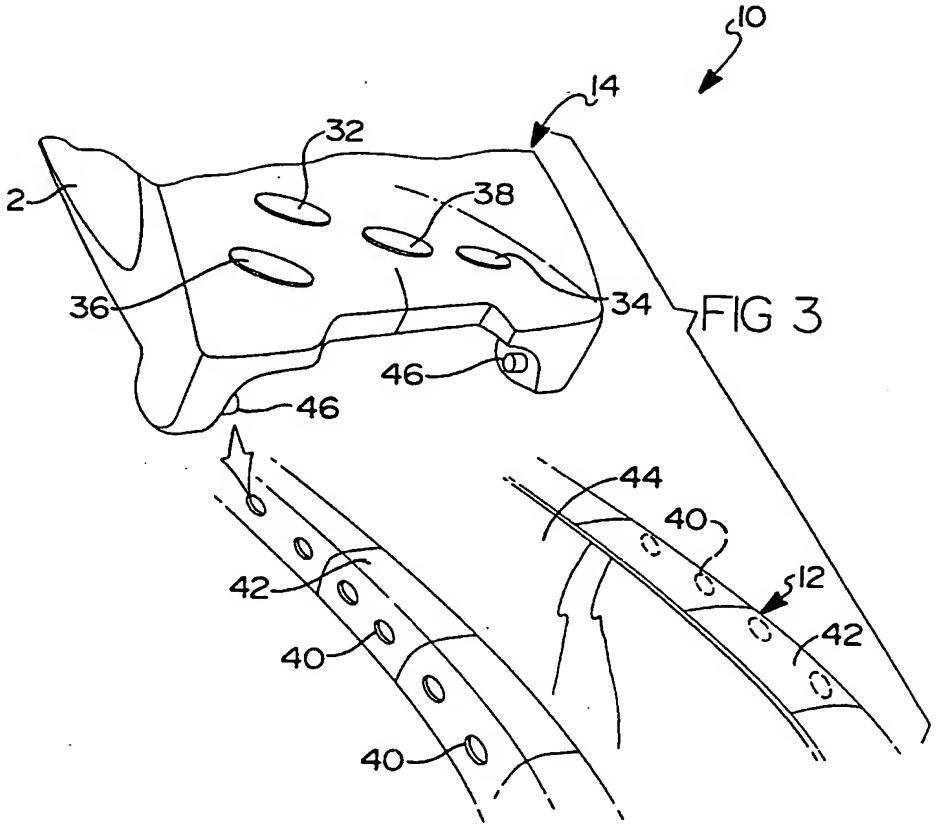
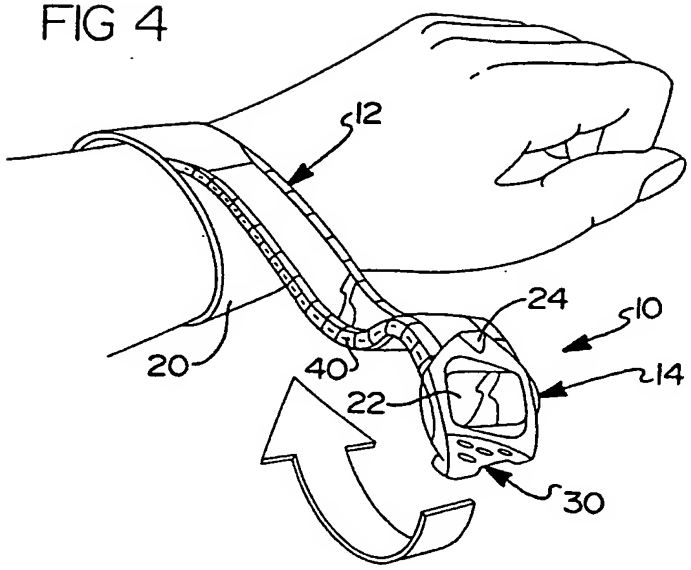


FIG 3

FIG 4



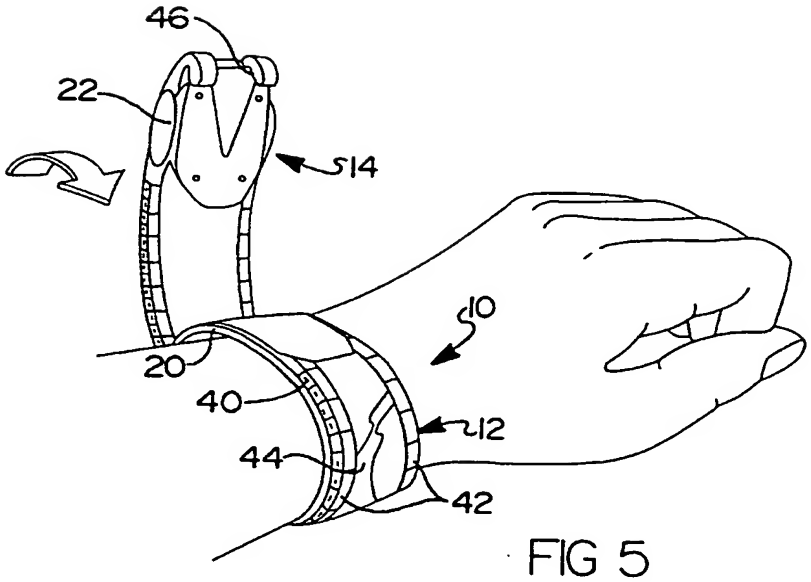
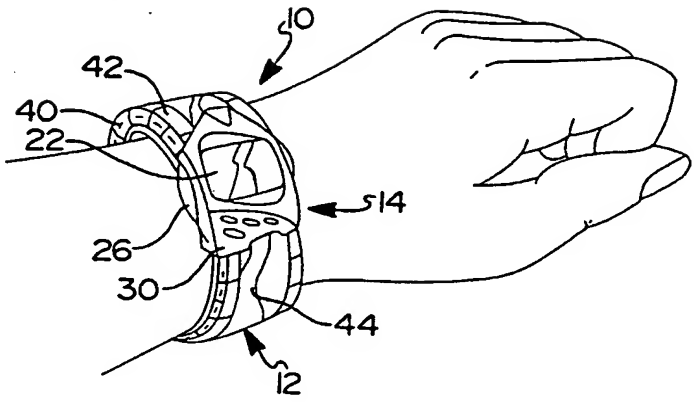


FIG 5

FIG 6



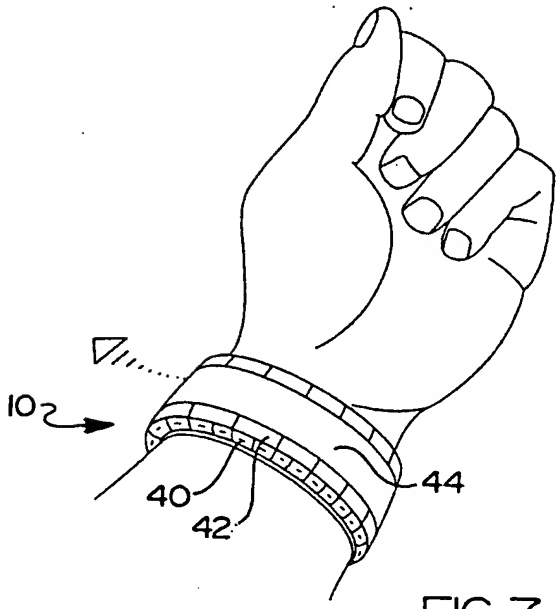
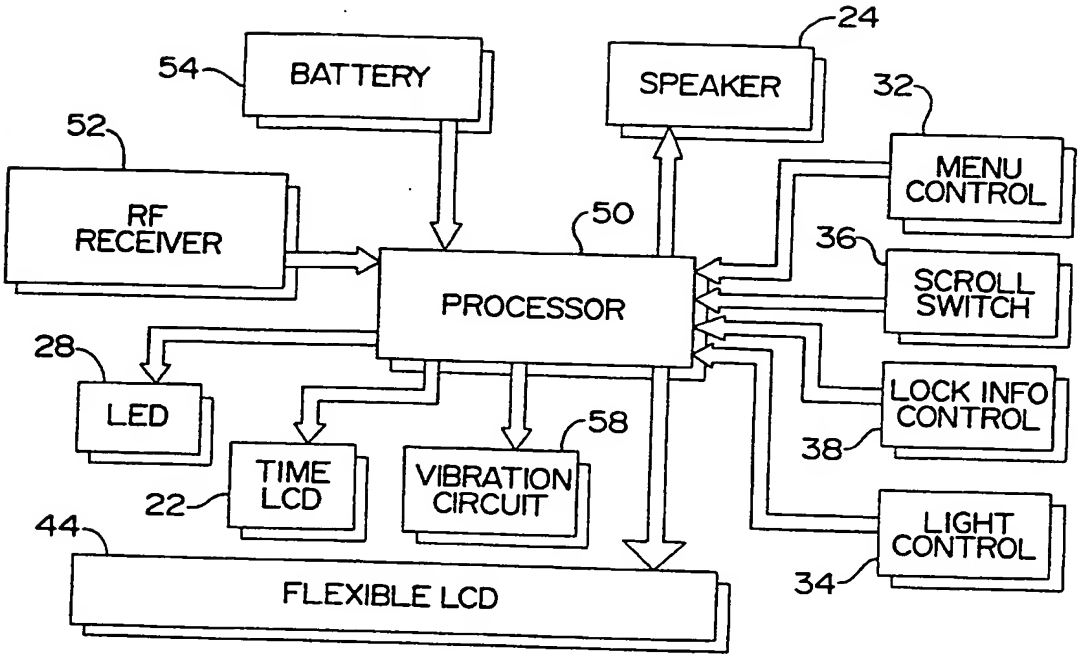


FIG 7

FIG 8


24
54
BATTERY
SPEAKER
32
52
MENU CONTROL
RF RECEIVER
50
36
PROCESSOR
SCROLL SWITCH
28
LED
LOCK INFO CONTROL
58
38
TIME LCD
VIBRATION CIRCUIT
22
44
LIGHT CONTROL
FLEXIBLE LCD
34

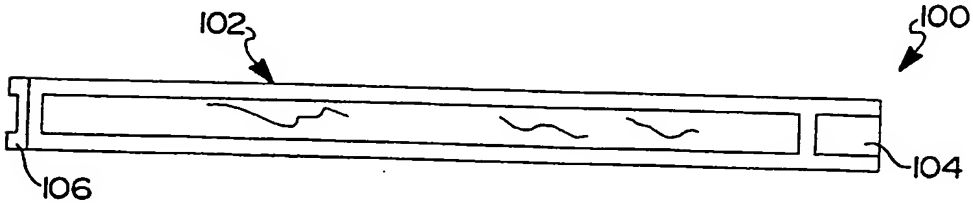

102
100
104
106

FIG 9

INTERNATIONAL SEARCH REPORT

Int. ..onal Application No
PCT/IB 00/00186

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G04B47/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G04B A44C G04G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, PAJ, WPI Data, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 21888 A (RADLEY SMITH PHILIP JOHN) 18 July 1996 (1996-07-18) page 5, line 5 -page 9, line 8; figures 1-3	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 June 2000	28/06/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Pineau, A

1

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

information on patent family members

Int'l Application No
PCT/IB 00/00186

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9621888 A	18-07-1996	AU 4395096 A	31-07-1996
		EP 0803084 A	29-10-1997
		GB 2297021 A,B	24-07-1996
		GB 2328139 A,B	17-02-1999